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## **AMENDMENTS**

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## In the Claims

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10.(previously presented) A composition comprising a polymerizing agent including a molecular and/or atomic tag covalently bonded to a site on the polymerizing agent and a monomer including a molecular and/or atomic tag, where at least one of the tags has a fluorescence property that undergoes a change before, during and/or after each of a sequence of monomer incorporations due to an interaction between the polymerizing agent tag and the monomer tag and where the changes in the detectable property generate data evidencing each monomer incorporation producing a monomer sequence read out.

11.(previously presented) The composition of claim 10, wherein the change in the fluorescence property results from a change in the conformation of the polymerizing agent from a first conformational state to a second conformational state and back again during each monomer incorporation.

12.(previously presented) The composition of claim 10, wherein the fluorescence property has a first detection propensity when the polymerizing agent is in the first conformational state and a second detection propensity when the polymerizing agent is in the a second conformational state.

13.(previously presented) The composition of claim 12, wherein the polymerizing agent is a polymerase or reverse transcriptase.

1 14.(previously presented) The composition of claim 13, wherein the polymerase is selected from 2 the group consisting of Tag DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow 3 fragment from E. coli DNA polymerase I. 1 The composition of claim 13, wherein the reverse transcriptase 15.(previously presented) 2 comprises HIV-1 reverse transcriptase. 1 The composition of claim 12, wherein each of the monomers 16.(previously presented) 2 comprises a deoxynucleotide triphosphate (dNTP) and the monomer tag is covalently bonded to the 3 β or γ phosphate group of each dNTP. 1 17.(previously presented) The composition of claim 10, wherein the tags comprise fluorescent 2 tags and the fluorescence property comprises an intensity and/or frequency of emitted fluorescent 3 light. 1 18.(currently amended) The composition of claim 17, wherein the fluorescentce property is 2 fluorescence resonance energy transfer (FRET) where either the monomer tag or the polymerase tag 3 comprises a donor and the other tag comprises an acceptor and where FRET occurs when the two 4 tags are in close proximity. 5 19.(currently amended) The composition of claim 14, wherein the polymerase comprises Tag 6 DNA polymerase I having a tag attached at a site selected from the group consisting of 513-518, 7 643, 647, 649 and 653-661 and mixtures or combinations thereof of the Tag polymerase, where the 8 tag comprises a fluorescent molecule. 20.(canceled) 21.(canceled) 22.(canceled) 22.(canceled)

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23.(canceled) 24.(canceled)

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25.(withdrawn)	A single molecule sequencing apparatus comprising a substrate having a first
chamber in which at	least one tagged polymerase is confined therein and a second chamber
including tagged dNT	Ps and a channel interconnecting the chambers, where a detectable property
of at least one tag und	ergoes a detectable change during a monomer incorporation cycle.

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26.(withdrawn) chambers, one for ea 27.(withdrawn) residue replacement	The apparatus of claims 24, further comprising a plurality of monomer ach tagged dNTP.  A mutant Taq polymerase comprising native Taq polymerase with a cysteine		
27.(withdrawn)			
` ,	A mutant Taq polymerase comprising native Taq polymerase with a cysteine		
` ,	A mutant Taq polymerase comprising native Taq polymerase with a cysteine		
residue replacement			
residue replacement at a site selected from the group consisting of 513-518, 643, 647, 649 and 653			
661 and mixtures or combinations thereof.			
28.(withdrawn)	The polymerase of claim 27, wherein the cysteine residue includes a tag		
covalently bonded thereto through the SH group.			
29.(withdrawn)	A system for retrieving stored information comprising:		
a unknown nucleotide sequence representing a data stream;			
a single-molecule sequencer including a polymerase having a tag associated therewith and			
monomers for the polymerase, each monomer having a tag associated therewith;			
an excitation source adapted to excite the at least one of the tags; and			
a detector adapted to detect a response from at least one of the tag,			
where the response changes during polymerization of a complementary sequence and the			
changes in response	represent a content of the data stream.		
30.(withdrawn)	A system for determining sequence information from a single molecule		
comprising:			
a unknown n	nucleotide sequence;		
a single-molecule sequencer comprising a polymerase having a tag associated therewith an			
monomers for the polymerase, each monomer having a tag associated therewith;			
	source adapted to excite at least one of the tags; and		
	28.(withdrawn) covalently bonded the covalen		

where the response changes during polymerization of a complementary sequence and the

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a detector adapted to detect a response from at least one of the tags,

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1	31.(withdrawn) A method for sequencing a molecular sequence comprising:			
2	supplying an unknown sequence of nucleotides or nucleotide analogs to a single-molecule			
3	sequencer comprising a polymerase having a fluorescent donor covalently attached thereto and			
4	monomers for the polymerase, each monomer having a unique fluorescent acceptor covalently			
5	bonded thereto;			
6	exciting the fluorescent donor with a light from an excitation light source;			
7	detecting emitted fluorescent light from the acceptor during a monomer incorporation cycle			
8	via a fluorescent light detector, where an intensity and/or frequency of the emitted light for the			
9	acceptors changes during each monomer incorporation cycle; and			
10	converting the changes into an identity of each nucleotide or nucleotide analog in the			
11	unknown sequene.			
1	32.(withdrawn) A method of sequencing an individual nucleic acid molecule or numerous			
2	individual molecules in parallel including the steps of:			
3	immobilizing a member of the replication complex comprising a polymerase including a tag			
4	attached thereto, a primer or a template sufficiently spaced apart to allow resolution detection of			
5 ′	each complex on a solid support;			
6	incubating the replication complex with cooperatively-tagged nucleotides, each nucleotide			
7	including a unique tag at its gamma-phosphate, where each nucleotide can be individually detected;			
8	detecting each nucleotide incorporated by the polymerase as the polymerase transitions			
9 .	between its open and closed form, which causes a change in a detectable property of at least one of			
10	the tags or as the pyrophosphate group is released by the polymerase; and			
11	relating the changes in the detectable property to the sequence of nucleotides in an unknown			
12	nucleic acid sequence.			
1	33.(withdrawn) A γ-phosphate modified nucleoside comprising γ-phosphate modified dATP,			
2	dCTP, dGTP and dTTP.			
1	34.(withdrawn) A primer sequence or portion thereof selected from the group consisting of			
2	Sequence 1 through 29.			

changes in the response represent the identity of each nucleotide in the unknown sequence.

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- 36.(canceled)
- 37.(canceled)
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- 39.(canceled)
- 40.(canceled)
- 41.(canceled)
- 42.(canceled)
- 43.(canceled)
- 44.(canceled)
- 45.(canceled)
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- 47.(canceled)

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- 48.(new) A composition comprising a polymerizing agent including at least one molecular and/or atomic tag covalently bonded to a site on the polymerizing agent, where a fluorescence property of the tags undergoes a change before, during and/or after each of a sequence of monomer incorporations and where the changes in the fluorescence property generate data evidencing each monomer incorporation producing a monomer incorporation read out and where the polymerizing agent comprises a Taq DNA polymerase I having a tag covalently bonded to an amino acid site of the Taq polymerase selected from the group consisting of 513-518, 643, 647, 649 and 653-661 and, where the tag comprises a fluorescent molecule.
- 1 49.(new) The composition of claim 48, wherein the fluorescence property has a first value 2 when the polymerizing agent is in a first state and a second value when the polymerizing agent is 3 in a second state, and where the polymerizing agent changes from the first state to the second state 4 and back again during each monomer incorporation.